

T. Alex Perkins

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Higher Education

Ph.D., Population Biology, University of California, Davis, 2006 – 2011

Committee: Alan Hastings (Chair), Michael Turelli, Marissa Baskett

B.A., Computational Ecology, University of Tennessee, Knoxville, 2002 – 2006

Co-advisors: Louis Gross and Susan Riechert

Appointments

Associate Professor with Tenure, Department of Biological Sciences, University of Notre Dame, 2020 – present

Concurrent Faculty, Department of Applied and Computational Mathematics and Statistics, University of Notre Dame, 2015 – present

Eck Family Assistant Professor, Department of Biological Sciences, University of Notre Dame, 2014 – 2020

Postdoctoral Fellow, Research and Policy for Infectious Disease Dynamics (RAPIDD) Program, Fogarty International Center, National Institutes of Health, 2011 – 2014
Co-mentors: Thomas W Scott and David L Smith

Scholarships and Fellowships

RAPIDD Postdoctoral Fellowship, Fogarty International Center, National Institutes of Health, 2011 – 2014, Nationally competitive postdoctoral fellowship that provided stipend and travel allowance

Computational Sciences Graduate Fellowship, Department of Energy, 2007 – 2011, Nationally competitive graduate fellowship that provided tuition, stipend, and research expenses

Barry Goldwater Scholarship, 2005 – 2006, Nationally competitive undergraduate scholarship in mathematics, the natural sciences, and engineering

Morris K. Udall Scholarship, 2004 – 2005, Nationally competitive undergraduate scholarship for leadership, public service, and commitment to issues related to Native American nations or to the environment

Tennessee Scholarship, 2002 – 2006, Merit-based, full-tuition scholarship to the University of Tennessee, Knoxville

Distinctions, Honors, Awards

Maximizing Investigators' Research Award (MIRA) R35, NIH NIGMS, 2021
College of Science Research Award, University of Notre Dame, 2021
Finalist, NIH Director's New Innovator Award, 2020
Early Career Fellow, Ecological Society of America, 2017 – 2022
DARPA Director's Fellowship, 2018 – 2019, Awarded to the top 10% of DARPA Young Faculty Award recipients and the only one awarded to three YFA recipients in infectious disease dynamics
DARPA Young Faculty Award, 2016 – 2018
Visiting Scholar, Institute for Disease Modeling, 2016
Ralph E. Powe Junior Faculty Enhancement Award, Oak Ridge Associated Universities, 2015
Volterra Award, Best student oral presentation on theory research, Ecological Society of America Annual Meeting, Albuquerque, NM 2009
Honorable Mention for Graduate Research Fellowship Program, National Science Foundation, 2007
Outstanding Graduate in Ecology and Evolutionary Biology, University of Tennessee, Knoxville, 2006
Chancellor's Citation for Extraordinary Professional Promise, University of Tennessee, Knoxville, 2006
Chancellor's Citation for Extraordinary Academic Achievement, University of Tennessee, Knoxville, 2006
summa cum laude, University of Tennessee, Knoxville, 2006
Phi Beta Kappa, Epsilon Chapter of Tennessee, 2004
University Honors Scholar, University of Tennessee, Knoxville, 2002 – 2006

Refereed Publications

Summary statistics

I have published a total of 75 peer-reviewed journal articles, with 62 of those deriving from work done as an independent investigator in the last 7+ years. Of those, 51/62 are primary research articles and 12/62 are reviews or perspectives. According to Google Scholar, I have been cited a total of 4,223 times and have an h-index of 33.

Information provided about each publication

For publications involving myself or those under my mentorship (underlined in author list), I denote lab members' statuses as (U) for undergraduate, (G) for graduate, (P) for postdoc, and (F) for research faculty. I have indicated authors with equal contributions as (co) after such authors' names.

2021

75. Perkins TA, JH Huber (G), QM Tran (G), RJ Oidtman (G), MK Walters (U), AS Siraj (P), SM Moore (F). Burden is in the eye of the beholder: Sensitivity of yellow fever disease burden estimates to modeling assumptions. **Science Advances** 7:eabg5033.

74. Oidtman RJ (G), E Omodei, MUG Kraemer, CA Castaneda-Orjuela, E Cruz-Rivera, S Misnaza-Castrillon, MP Cifuentes, LE Rincon, V Canon, P de Alarcon, G España (F), J Huber (G), SC Hill, CM Barker, MA Johansson, CA Manore, RC Reiner, I Rodriguez-Barraquer, AS Siraj, E Frias-Martinez, M Garcia-Herranz, TA Perkins. Trade-offs between individual and ensemble forecasts of an emerging infectious disease. ***Nature Communications*** 12:5379.
73. España G (P), SM Cavany (P) (co), RJ Oidtman (G) (co), C Barbera (G), A Costello (G), A Lerch (P), M Poterek (G), Q Tran (G), A Wieler (G), S Moore (F), TA Perkins. Impacts of K-12 school reopening on the COVID-19 epidemic in Indiana, USA. ***Epidemics*** 37:100487.
72. Toor J, S Echeverria-Londono, X Li, K Abbas, ED Carter, HE Clapham, A Clark, MJ de Villiers, K Eilertson, M Ferrari, I Gamkrelidze, TB Hallett, WR Hinsley, D Hogan, JH Huber (G), ML Jackson, K Jean, M Jit, A Karachaliou, P Klepac, A Kraay, J Lessler, X Li, BA Lopman, T Mengistu, CJE Metcalf, SM Moore (F), S Nayagam, T Papadopoulos, TA Perkins, A Portnoy, H Razavi, D Ravazi-Shearer, S Resch, C Sanderson, S Sweet, Y Tam, H Tanvir, QM Tran (G), CL Trotter, SA Truelove, E Vynnycky, N Walker, A Winter, K Woodruff, NM Ferguson, KAM Gaythorpe. Lives saved with vaccination for 10 pathogens across 112 countries in a pre-COVID world. ***eLife*** 10:e67635.
71. Schaber KL, AC Morrison, WH Elson, H Astete-Vega, JJ Córdova-López, EJ Ríos-López, WL Quiroz Flores, AS Vizcarra Santillan, TW Scott, LA Waller, U Kitron, CM Barker, TA Perkins, AL Rothman, G Vazquez-Prokopec, JP Elder. The impact of dengue illness on social distancing and caregiving behavior. ***PLOS Neglected Tropical Diseases*** 15:e0009614.
70. España G (P), AJ Leidner, S Waterman, TA Perkins. Cost-effectiveness of dengue vaccination. ***PLOS Neglected Tropical Diseases*** 15:e0009606.
69. Cavany SM (P), G España (P), GM Vazquez-Prokopec, TW Scott, TA Perkins. The impacts of COVID-19 mitigation on dengue virus transmission: a modelling study. ***PLOS Neglected Tropical Diseases*** 15:e0009603.
68. Gaythorpe K (co), K Abbas (co), J Huber (G) (co), A Karachaliou (co), N Thakkar (co), K Woodruff, X Li, S Echeverria-Londono, VIMC Working Group on COVID-19 Impact on Vaccine-Preventable Disease, M Ferrari (co), ML Jackson (co), K McCarthy (co), TA Perkins (co), C Trotter (co), M Jit (co). Impact of COVID-19-related disruptions to measles, meningococcal A, and yellow fever vaccination in 10 countries. ***eLife*** 10:e67023.
67. Bron G, K Strimbu (U), H Cecilia, A Lerch (P), SM Moore (F), Q Tran (G), TA Perkins, QA ten Bosch. Over 100 years of Rift Valley fever: a patchwork of data on pathogen spread and spillover. ***Pathogens*** 10:708.
66. Brito AF (co), LC Machado LC (co), MJL Siconelli (co), RJ Oidtman (G) (co), JR Fauver (co), RD Carvahlo, FZ Dezordi, MR Pereira, LA deCastro-Jorge, ECM Minto, LMR Passos, CC Kalinich, ME Petrone, E Allen, G España (P), AT Huang, DAT Cummings, G Baele, RFO Franca (co), TA Perkins (co), BAL da Fonseca (co), GL Wallau (co), ND Grubaugh (co). 2021. Lying in wait: the resurgence of dengue virus after the Zika epidemic in Brazil. ***Nature Communications*** 12:2619.

65. Oidtman RJ (G), G España (P), TA Perkins. 2021. Co-circulation and misdiagnosis led to underestimation of the 2015-2017 Zika epidemic in the Americas. ***PLOS Neglected Tropical Diseases*** 15:e0009208.
64. Poterek M (U), MUG Kraemer, A Watts, K Khan, TA Perkins. 2021. Air passenger travel and international surveillance data predict spatiotemporal variation in measles importations to the United States. ***Pathogens*** 10:155.
63. Schaber KL, TA Perkins, AL Lloyd, LA Waller, U Kitron, VA Paz-Soldan, JP Elder, AL Rothman, DJ Civitello, WH Elson, AC Morrison, TW Scott, GM Vazquez-Prokopec. 2021. Disease-driven reduction in human mobility influences human-mosquito contacts and dengue transmission dynamics. ***PLOS Computational Biology*** 17:e1008627.

2020

62. Walters MK (U), TA Perkins. 2020. Hidden heterogeneity and its influence on dengue vaccination impact. ***Infectious Disease Modelling*** 5:783.
61. Perkins TA, G España (P). 2020. Optimal control of the COVID-19 pandemic with non-pharmaceutical interventions. ***Bulletin of Mathematical Biology*** 82:118.
60. Moore SE (F), RJ Oidtman (G), KJ Soda (P), AS Siraj (P), RC Reiner, CM Barker, TA Perkins. 2020. Leveraging multiple data types to estimate the true size of the Zika epidemic in the Americas. ***PLOS Neglected Tropical Diseases*** 14:e0008640.
59. ten Bosch QA (G), J Wagman, F Castro-Llanos, ST Stoddard, AC Morrison, NL Achee, J Grieco, TA Perkins. 2020. Community-level impacts of spatial repellents for control of diseases vectored by *Aedes aegypti* mosquitoes. ***PLOS Computational Biology*** 16:e1008190.
58. Perkins TA (co), SM Cavany (co), SM Moore (co), RJ Oidtman, A Lerch, M Poterek. 2020. Estimating unobserved SARS-CoV-2 infections in the United States. ***Proceedings of the National Academy of Sciences*** 117:22597.
57. Chaves LF, JH Huber (G), O Rojas Salas, M Ramirez Rojas, LM Romero, JM Gutierrez Alvarado, TA Perkins, M Prado, RM Rodriguez. 2020. Malaria elimination in Costa Rica: changes in treatment and mass drug administration. ***Microorganisms*** 8:984.
56. Bivins A, D North, A Ahmad, W Ahmed, E Alm, F Been, P Bhattacharya, L Bijlsma, AB Boehm, J Brown, G Buttiglieri, V Calabro, A Carducci, A Castiglioni, Z Gurol, S Chakraborty, F Costa, S Curcio, F de los Reyes, J Vela, K Farkas, X Fernandez-Casi, C Gerba, D Gerrity, R Girones, R Gonzalez, E Haramoto, A Harris, P Holden, M Islam, D Jones, B Kasprzyk-Hordern, M Kitajima, N Kotlarz, M Kumar, K Kuroda, G La Rosa, F Malpei, M Mautus, S McLellan, G Medema, J Meschke, J Mueller, R Newton, D Nilsson, R Noble, A van Nuijs, J Peccia, TA Perkins, A Pickering, J Rose, G Sanchez, A Smith, L Stadler, C Stauber, K Thomas, T van der Voorn, K Wigginton, K Zhu, K Bibby. 2020. Wastewater-based epidemiology: global collaborative to maximize contributions in the fight against COVID-19. ***Environmental Science and Technology*** 54:7754-7757.
55. Kraemer MUG, A Sadilek, Q Zhang, NA Marchal, G Tuli, EL Cohn, Y Hswen, TA Perkins, DL Smith, RC Reiner, JS Brownstein. 2020. Mapping global variation in human mobility. ***Nature Human Behaviour*** 4:800.

54. Siraj AS (P), A Sorichetta, G España (P), AJ Tatem, TA Perkins. 2020. Modeling human migration across spatial scales in Colombia. ***PLOS ONE*** 15:e0232702.
53. Cavany SM (P), G España (P), AL Loyd, LA Waller, U Kitron, H Astete, WH Elson, GM Vazquez-Prokopec, TW Scott, AC Morrison, RC Reiner, TA Perkins. 2020. Optimizing the deployment of ultra-low volume and indoor residual spraying for dengue outbreak response. ***PLOS Computational Biology*** 16:e1007743.
52. Mayo CE, EG McDermott, J Kopanke, M Stenglein, J Lee, C Mathiason, M Carpenter, K Reed, TA Perkins. 2020. Ecological dynamics impacting bluetongue virus transmission in North America. ***Frontiers in Veterinary Science*** doi:10.3389/fvets.2020.00186.
51. Lloyd A, U Kitron, TA Perkins, GM Vazquez-Prokopec, L Waller. 2020. The basic reproductive number for disease systems with multiple coupled heterogeneities. ***Mathematical Biosciences*** 321:108294.

2019

50. KL Schaber, VA Paz Soldan, AC Morrison, WHD Elson, AL Rothman, CN Mores, H Astete-Vega, TW Scott, LA Waller, U Kitron, JP Elder, CM Barker, TA Perkins, GM Vazquez-Prokopec. 2019. Dengue illness impacts daily human mobility patterns in Iquitos, Peru. ***PLOS Neglected Tropical Diseases*** 13:e0007756.
49. Perkins TA (co), I Rodriguez-Barraquer (co), C Manore (co), AS Siraj (P), G España (P), CM Barker, MA Johansson, RC Reiner (co). 2019. Heterogeneous local dynamics revealed by classification analysis of spatially disaggregated time series data. ***Epidemics*** 100357.
48. Grubaugh ND (co), S Saraf (co), K Gangavarapu (co), A Watts, AL Tan, RJ Oidtman (G), JT Ladner, G Oliveira, NL Matteson, MUG Kraemer, CBF Vogels, D Bhatia, D Stanek, B Scott, V Landis, I Stryker, MR Cone, EW Kopp, AC Cannons, L Heberlein-Larson, S White, LD Gillis, MR Wiley, K Prieto, M Ricciardi, J Kwal, PK Lichtenberger, DM Magnani, DI Watkins, G Palacios, LM Gardner, S Isern, TA Perkins, G Baele, K Khan, A Morrison, SF Michael, KG Andersen. 2019. Travel surveillance and genomics uncover a hidden Zika outbreak during the waning epidemic. ***Cell*** 178:1057-1071.
47. G España (P), Y Yao (U), KB Anderson, MC Fitzpatrick, DL Smith, AC Morrison, A Wilder-Smith, TW Scott, TA Perkins. 2019. Model-based assessment of public health impact and cost-effectiveness of dengue vaccination following screening for prior exposure. ***PLOS Neglected Tropical Diseases*** 13:e0007482.
46. SJ Fox, SE Bellan, TA Perkins, MA Johansson, LA Meyers. 2019. Downgrading disease transmission risk estimates using terminal importations. ***PLOS Neglected Tropical Diseases*** 13:e0007395.
45. Reiner RC, ST Stoddard, GM Vazquez-Prokopec, H Astete, TA Perkins, M Sihuincha, J Stancil, DL Smith, T Kochel, E Halsey, U Kitron, AC Morrison, TW Scott. 2019. Estimating the impact of city-wide *Aedes aegypti* population control: an observational study in Iquitos, Peru. ***PLOS Neglected Tropical Diseases*** 13:e0007255.
44. Perkins TA (co), RC Reiner (co), G España (P) (co), QA ten Bosch (G), A Verma, K Liebman, VA Paz-Soldan, JP Elder, AC Morrison, ST Stoddard, U Kitron, GM Vazquez-Prokopec, TW Scott, DL Smith. 2019. An agent-based model of dengue

- virus transmission shows how uncertainty about breakthrough infections influences vaccination impact projections. *PLOS Computational Biology* 15:e1006710.
43. Oidtman RJ (G), S Lai, Z Huang, J Yang, AS Siraj (P), RC Reiner, AJ Tatem, TA Perkins, H Yu. 2019. Inter-annual variation in seasonal dengue epidemics driven by multiple interacting factors in Guangzhou, China. *Nature Communications* 10:1148.
 42. Phillips BL, TA Perkins. 2019. Spatial sorting as the spatial analogue of natural selection. *Theoretical Ecology* 12:155.
 41. Kraemer MUG (co), RC Reiner (co), OJ Brady (co), JP Messina (co), M Gilbert (co), DM Pigott, D Yi, K Johnson, L Earl, LB Marczak, S Shirude, ND Weaver, D Bisanzio, TA Perkins, S Lai, X Lu, P Jones, GE Coelho, RG Carvalho, W van Bortel, C Marsboom, G Hendrickx, F Schaffner, CG Moore, HH Nax, L Bengtsson, E Wetter, AJ Tatem, JS Brownstein, DL Smith, L Lambrechts, S Cauchemez, C Linard, NR Faria, OG Pybus, TW Scott, Q Liu, H Yu, GRW Wint, SI Hay, N Golding. 2019. Past and future spread of the arbovirus vectors *Aedes aegypti* and *Aedes albopictus*. *Nature Microbiology* 4:854.
 40. España G (P), C Hoge, A Guignard, QA ten Bosch (G), AC Morrison, DL Smith, TW Scott, A Schmidt, TA Perkins. 2019. Biased efficacy estimates in phase-III dengue vaccine trials due to heterogeneous exposure and differential detectability of primary infections across trial arms. *PLOS ONE* 14:e0210041.
 39. Vogels CBF (co), C Ruckert (co), SM Cavany (P) (co), TA Perkins, GD Ebel, ND Grubaugh. 2019. Arbovirus coinfection and co-transmission: a neglected public health concern? *PLOS Biology* 17:e3000130.

2018

38. Wesolowski A, A Taylor, H-H Change, R Verity, S Tessema, J Bailey, TA Perkins, D Neafsey, B Greenhouse, CO Buckee. 2018. Mapping malaria by combining parasite genomic and epidemiologic data. *BMC Medicine* 16:190.
37. España G (P), J Grefenstette, TA Perkins, C Torres, A Campo Carey, H Diaz, F de la Hoz, DS Burke, WG van Panhuis. 2018. Exploring scenarios of chikungunya mitigation with a data-driven agent-based model of the 2014-2016 outbreak in Colombia. *Scientific Reports* 8:12201.
36. Moore SM (F), QA ten Bosch (G), AS Siraj (P), KJ Soda (P), G España (P), A Campo, S Gómez, D Salas, B Raybaud, E Wenger, P Welkhoff, TA Perkins. 2018. Local and regional dynamics of chikungunya virus transmission in Colombia: the role of mismatched spatial heterogeneity. *BMC Medicine* 16:152.
35. Bershteyn A, J Gerardin, D Bridenbecker, C Lorton, J Bloedow, R Baker, G Chabot-Couture, Y Chen, T Fischle, K Frey, J Gauld, H Hu, A Izzo, D Klein, D Kuacevic, K McCarthy, J Miller, AL Ouedraogo, TA Perkins, J Steinkraus, QA ten Bosch (G), H-F Ting, S Titova, B Wagner, P Welkhoff, E Wenger. 2018. Implementation and applications of the EMOD individual-based modeling platform: software design and development processes to enable multi-scale modeling. *Pathogens and Disease* 76:fty059.
34. Kraemer MUG (co), D Bisanzio, RC Reiner, R Zakar, J Hawkins, CC Freifeld, DL Smith, SI Hay, JB Brownstein, TA Perkins. 2018. Inferences about spatiotemporal

variation in dengue virus transmission are sensitive to assumptions about intra-urban human mobility. **EPJ Data Science** 7:16.

33. ten Bosch QA (G), F Castro-Llanos, H Manda, AC Morrison, J Grieco, NL Achee, TA Perkins. 2018. Model-based analysis of experimental hut data elucidates multifaceted effects of a volatile chemical on *Aedes aegypti* mosquitoes. **Parasites and Vectors** 11:365.
32. ten Bosch QA (G), HE Clapham, L Lambrechts, BM Althouse, V Duong, P Buchey, AL Lloyd, LA Waller, AC Morrison, U Kitron, GM Vazquez-Prokopec, TW Scott, TA Perkins. 2018. Contributions from the silent majority dominate dengue virus transmission. **PLOS Pathogens** 14:e1006965.

2017

31. AS Siraj (P), I Rodriguez-Barraquer, CM Barker, AJ Tatem, C Manore, MA Johansson, RC Reiner, TA Perkins. 2017. Spatiotemporal incidence of Zika and associated environmental drivers for the 2015-2016 epidemic in Colombia. **Scientific Data** 5:180073.
30. Siraj AS (P), TA Perkins. 2017. Assessing the population at risk of Zika in Asia – is the emergency really over? **BMJ Global Health** 2:e000309.
29. Siraj AS (P), R Oidtman (G), J Huber (U), MUG Kraemer, OJ Brady, M Johansson, TA Perkins. 2017. Temperature modulates dengue virus epidemic growth rates through its effects on reproduction numbers and generation intervals. **PLOS Neglected Tropical Diseases** 11:e0005797.

2016

28. Flasche S (co), M Jit (co), I Rodriguez-Barraquer (co), L Coudeville (co), M Recker (co), K Koelle (co), G Milne (co), T Hladish (co), TA Perkins (co), I Dorigatti, DAT Cummings, G Espana (P), J Kelso, I Longini, J Lourenco, C Pearson, RC Reiner, NM Ferguson. 2016. The long-term safety, public health impact, and cost-effectiveness of routine vaccination with a recombinant, live-attenuated dengue vaccine (Dengvaxia): a model comparison study. **PLOS Medicine** 13:e1002181.
27. Oidtman RJ (G), RC Christofferson, QA ten Bosch (G), G España (P), MUG Kraemer, AJ Tatem, CM Barker, TA Perkins. 2016. *Pokémon Go* and exposure to mosquito-borne diseases: how not to catch 'em all. **PLOS Currents Outbreaks**.
26. Huber JH (U), G Johnston, B Greenhouse, DL Smith, TA Perkins. 2016. Quantitative, model-based estimates of variability in the generation and serial intervals of *Plasmodium falciparum* malaria. **Malaria Journal**. 15:490.
25. Perkins TA, C Boettiger, BL Phillips. 2016. After the games are over: life-history trade-offs drive dispersal attenuation following range expansion. **Ecology and Evolution** 6:6425.
24. Perkins TA, AS Siraj (P), C Warren Ruktonanchai, MUG Kraemer, AJ Tatem. 2016. Model-based projections of Zika virus infections in childbearing women in the Americas. **Nature Microbiology** 1:16216.
23. Perkins TA, V Paz Soldan, ST Stoddard, AC Morrison, BM Forshey, KC Long, J Elder, U Kitron, TW Scott, GM Vazquez-Prokopec. 2016. Calling in sick: impacts of fever on human mobility in an urban environment. **Proceedings of the Royal Society B** 283:20160390.

22. Reiner RC, NL Achee, R Barrera, T Burkot, D Chadee, G Devine, T Endy, D Gubler, J Hombach, I Kleinschmidt, A Lenhart, S Lindsay, I Longini, M Mondy, AC Morrison, TA Perkins, GM Vazquez-Prokopec, P Reiter, S Ritchie, DL Smith, D Strickman, TW Scott. 2016. Quantifying the epidemiological impact of vector control on dengue. ***PLOS Neglected Tropical Diseases*** 10:e0004588.
21. Brady OJ, HCJ Godfray, AJ Tatem, PW Gething, JM Cohen, FE McKenzie, TA Perkins, RC Reiner, LS Tusting, ME Sinka, CL Moyes, PA Eckhoff, TW Scott, SW Lindsay, SI Hay, DL Smith. 2016. Vectorial capacity and vector control: reconsidering sensitivity to parameters for malaria elimination. ***Transactions of the Royal Society of Tropical Medicine and Hygiene*** 110:107-117.
20. Vazquez-Prokopec GM, TA Perkins, L Waller, A Lloyd, RC Reiner, TW Scott, U Kitron. 2016. Coupled heterogeneities and their impact on parasite transmission and control. ***Trends in Parasitology*** 32:356-367.

2015

19. Reiner RC, A Le Menach, S Kunene, N Ntshalintshali, M Hsiang, TA Perkins, B Greenhouse, AJ Tatem, JM Cohen, DL Smith. 2015. Mapping residual transmission for malaria elimination. ***eLife*** 4:e09520.
18. Kraemer MUG, TA Perkins, DAT Cummings, R Zakar, SI Hay, DL Smith, RC Reiner. 2015. Big city, small world: density, contact rates, and transmission of dengue across Pakistan. ***Journal of the Royal Society Interface*** 12:20150468.
17. Lai S, Z Huang, H Zhou, KL Anders, TA Perkins, W Yin, Y Li, D Mu, Q Chen, Z Zhang, Y Qiu, L Wang, H Zhang, L Zeng, X Ren, M Geng, Z Li, AJ Tatem, SI Hay, H Yu. 2015. The changing epidemiology of dengue in China, 1990-2014: a descriptive analysis of 25 years of nationwide surveillance data. ***BMC Medicine*** 13:100.
16. Achee NL, F Gould, TA Perkins, RC Reiner, AC Morrison, SA Ritchie, DJ Gubler, R Teyssou, TW Scott. 2015. A critical assessment of vector control for dengue prevention. ***PLOS Neglected Tropical Diseases*** 9:e0003655.
15. Brady OJ, HCJ Godfray, AJ Tatem, PW Gething, JM Cohen, FE McKenzie, TA Perkins, RC Reiner, LS Tusting, TW Scott, SW Lindsay, SI Hay, DL Smith. 2015. Adult vector control, mosquito ecology, and malaria transmission. ***International Health*** 7:121-129.
14. Perkins TA, CJE Metcalf, BT Grenfell, AJ Tatem. 2015. Estimating drivers of autochthonous transmission of chikungunya virus in its invasion of the Americas. ***PLOS Currents Outbreaks*** 2015 Feb 10.

Prior to Becoming an Independent Investigator

13. Phillips JE, D Stallknecht, TA Perkins, N McClure, D Mead. 2014. Evolutionary dynamics of West Nile virus in Georgia, 2001-2011. ***Virus Genes*** 49:132-136.
12. Perkins TA, AJ Garcia, VA Paz Soldan, ST Stoddard, RC Reiner, GM Vazquez-Prokopec, D Bisanzo, ES Halsey, TJ Kochel, AC Morrison, DL Smith, TW Scott, AJ Tatem. 2014. Theory and data for simulating fine-scale human movement in an urban environment. ***Journal of the Royal Society Interface*** 11:20140642.
11. Guerra CA, RC Reiner, TA Perkins, SW Lindsay, J Midega, OJ Brady, CM Barker, WK Reisen, LC Harrington, W Takken, U Kitron, AL Lloyd, TW Scott, DL Smith.

2014. A global assembly of adult female mosquito mark-release-recapture data to inform vector-borne pathogen transmission models. *Parasites and Vectors* 7:276.
10. Smith DL, TA Perkins, RC Reiner, CM Barker, T Niu, LF Chaves, AM Ellis, DB George, A Le Menach, JRC Pulliam, D Bisanzio, C Buckee, C Chiyaka, DAT Cummings, AJ Garcia, ML Gatton, PW Gething, DM Hartley, G Johnston, EY Klein, E Michael, SW Lindsay, AL Lloyd, DM Pigott, WK Reisen, N Ruktanonchai, BK Singh, J Stoller, AJ Tatem, U Kitron, SI Hay, TW Scott. 2014. Recasting the dynamics of mosquito-borne pathogen transmission and control. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 108:185-197.
 9. Liebman KA, ST Stoddard, RC Reiner, TA Perkins, H Astete, M Sihuincha, ES Halsey, TJ Kochel, AC Morrison, TW Scott. 2014. Heterogeneous blood feeding patterns of *Aedes aegypti* in Iquitos, Peru. *PLOS Neglected Tropical Diseases* 8:e2702.
 8. Perkins TA, TW Scott, A Le Menach, DL Smith. 2013. Heterogeneity, mixing, and the spatial scales of mosquito-borne pathogen transmission. *PLOS Computational Biology* 9:e1003327.
 7. Smith DL, TA Perkins, LS Tusting, TW Scott, SW Lindsay. 2013. Mosquito population regulation and larval source management in heterogeneous environments. *PLOS ONE* 8:e71247.s
 6. Reiner RC (co), TA Perkins (co), CM Barker, T Niu, LF Chaves, AM Ellis, DB George, A Le Menach, JRC Pulliam, D Bisanzio, C Buckee, C Chiyaka, DAT Cummings, AJ Garcia, ML Gatton, PW Gething, DM Hartley, G Johnston, EY Klein, E Michael, SW Lindsay, AL Lloyd, DM Pigott, WK Reisen, N Ruktanonchai, BK Singh, AJ Tatem, U Kitron, SI Hay, TW Scott, DL Smith. 2013. A systematic review of mathematical models of mosquito-borne pathogen transmission: 1970-2010. *Journal of the Royal Society Interface* 10:20120921.
 5. Perkins TA, BL Phillips, ML Baskett, A Hastings. 2013. Evolution of dispersal and life history interact to drive accelerating spread of an invasive species. *Ecology Letters* 16:1079-1087.
 4. Perkins TA. 2012. Evolutionarily labile species interactions and spatial spread of invasive species. *American Naturalist* 179:E37-E54.
 3. Perkins TA, HI Jager. 2011. Falling behind: delayed growth explains life-history variation in Snake River fall Chinook salmon. *Transactions of the American Fisheries Society* 140:959-972.
 2. Perkins TA, WR Holmes, JF Weltzin. 2007. Multi-species interactions in competitive hierarchies: new methods and empirical test. *Journal of Vegetation Science* 18:685-692.
 1. Perkins TA, SE Riechert, TC Jones. 2007. Interactions between the social spider *Anelosimus studiosus* (Araneae, Theridiidae) and foreign spiders that frequent its nests. *Journal of Arachnology* 35:143-152.

Unrefereed Publications

- U9. Perkins TA, Q Tran (G). 2021. Timing is everything when it comes to pertussis vaccination. *Lancet Infectious Diseases* doi:10.1016/S1473-3099(21)00353-4.

- U8. Walker E, K Bibby, TA Perkins, J Hixson. 2020. Indiana Wastewater Monitoring Program: Sampling Community Watersheds for SARS-CoV-2. **State of Indiana**. <https://www.in.gov/ifa/files/Indiana-Wastewater-Monitoring-Report-2020.pdf>
- U7. Buckee CO, S Balsari, J Chan, M Crosas, F Dominici, U Gasser, YH Grad, B Grenfell, ME Halloran, MUG Kraemer, M Lipsitch, CJE Metcalf, LA Meyers, TA Perkins, M Santillana, SV Scarpino, C Viboud, A Wesolowski, A Schroder. 2020. Aggregated mobility data could help fight COVID-19. **Science** eabb8021.
- U6. Perkins TA, G España (P), SM Moore (F), RJ Oidtman (G), S Sharma, B Singh, AS Siraj (P), KJ Soda (P), M Smith, MK Walters (U), E Michael. 2020. Seven Lessons about the Role of Space in Vector-Borne Disease Epidemiology. In: **Population Biology of Vector-Borne Diseases** (J Drake, MB Bonsall, MR Strand, eds.). Oxford University Press.
- U5. Perkins TA, J Rohr. 2020. Theories of Diversity in Disease Ecology. In: **Theoretical Ecology: Concepts and Applications, 4th edition**. (K McCann, G Gellner, eds.) Oxford University Press.
- U4. Perkins TA. 2019. Letter to the editor in response to 'Reconstruction and prediction of viral disease epidemics'. **Epidemiology and Infection** 147:398.
- U3. Perkins TA. 2017. Retracing Zika's footsteps across the Americas with computational modeling. **Proceedings of the National Academy of Sciences** 114:5558-5560.
- U2. Flasche S (co), M Jit (co), I Rodriguez-Barraquer (co), L Coudeville (co), M Recker (co), K Koelle (co), G Milne (co), T Hladish (co), TA Perkins (co), I Dorigatti, DAT Cummings, G España (P), J Kelso, I Longini, J Lourenco, C Pearson, RC Reiner, NM Ferguson. 2016. Comparative modelling of dengue vaccine public health impact. **World Health Organization**.
- U1. Perkins TA (co), RC Reiner (co), I Rodriguez-Barraquer, DL Smith, TW Scott, DAT Cummings. 2014. A review of transmission models of dengue: a quantitative and qualitative analysis of model features. In: **Dengue and Dengue Hemorrhagic Fever**. (D.J. Gubler, E.E. Ooi, and J. Farrar, eds.). pp. 99-114. CABI Publishing.

Manuscripts

- P12. Lerch A (P), QA ten Bosch, M L'Azou-Jackson, AA Bettis, M Bernuzzi, GAV Murphy, QM Tran (G), JH Huber (G), A Siraj (P), M Elliott (U), C Hartlage (U), K Koh (U), K Strimbu (U), M Walters (U), TA Perkins, SM Moore (F). Projecting vaccine demand and impact for emerging zoonotic pathogens. *medRxiv* doi:10.1101/2021.11.09.21266135.
- P11. Huber JH (G), M Elliott (U), C Koepfli, TA Perkins. The impact of emerging *Plasmodium knowlesi* on accurate diagnosis by light microscopy: a systematic review and modeling analysis. *medRxiv* doi:10.1101/2021.09.08.21263294.
- P10. España G (F) (co), TA Perkins (co), S Pollett, ME Smith (P), SM Moore (F), P Kwon, T Hall, MH Beagle, Jr., CK Murray, S Hakre, S Peel, K Modjarrad, PT Scott. Prioritizing interventions for preventing COVID-19 outbreaks in military basic training.
- P9. Kopanke J, M Carpenter, J Lee, K Reed, C Rodgers, M Burton, K Lovett, J Westrich, E McNulty, E McDermott, C Barbera (G), S Cavany (P), J Rohr,

- TA Perkins, C Mathiason, M Stenglein, C Mayo. Bluetongue Research at a Crossroads: Modern Genomics Tools Can Pave the Way to New Insights.
- P8. Perkins TA, M Stephens, W Alvarez Barrios, SM Cavany (P), L Rulli, ME Pfrender. Performance of three molecular tests for SARS-CoV-2 on a university campus estimated jointly with Bayesian latent class modeling. *medRxiv* doi:10.1101/2021.07.31.21261425.
- P7. Cavany S (P), A Bivins, Z Wu, D North, K Bibby (co), TA Perkins (co). Inferring SARS-CoV-2 RNA shedding into wastewater relative to time of infection. *medRxiv* doi:10.1101/2021.06.03.21258238.
- P6. Huber JH (G), LF Chaves, AS Siraj (P), JE Moreno, M Villegas, L Pocatererra, L Villegas, TA Perkins. An epidemiological and intervention assessment of the malaria epidemic in Bolívar, Venezuela: A modelling study.
- P5. Huber JH (G), C Koepfli, G España (F), N Nekkab, MT White, TA Perkins. Site-specific biases in phase-III clinical trials underestimate the effect of radical cure against *Plasmodium vivax* hypnozoites. *medRxiv* doi:10.1101/2021.01.28.21250689.
- P4. Huber JH (G), MS Hsiang, N Dlamini, M Murphy, S Vilakati, N Nhlabathi, A Lerch (P), R Nielsen, N Ntshalintshali, B Greenhouse, TA Perkins. Inferring person-to-person networks of pathogen transmission: is routine surveillance data up to the task? *medRxiv* doi:10.1101/2020.08.24.20180844.
- P3. Shea K, RK Borchering, WJM Probert, E Howerton, TL Bogich, S Li, WG van Panhuis, C Viboud, R Aguas, A Belov, SH Bhargava, S Cavany (P), JC Chang, C Chen, J Chen, S Chen, YQ Chen, LM Childs, CC Chow, I Crooker, SY Del Valle, G España (P), G Fairchild, RC Gerkin, TC Germann, Q Gu, X Guan, L Guo, GR Hart, TJ Hladish, N Hupert, D Janies, CC Kerr, DJ Klein, E Klein, G Lin, C Manore, LA Meyers, J Mittler, K Mu, RC Nunez, R Oidtmann (G), R Pasco, A Pastore y Pionti, R Paul, CAB Pearson, D Perdomo, TA Perkins, K Pierce, AN Pillai, RC Rael, K Rosenfeld, CW Ross, JA Spencer, AB Stoltzfus, KB Toh, S Vattikuti, A Vespignani, L Wang, L White, P Xu, Y Yang, ON Yogurtcu, W Zhang, Y Zhao, D Zou, M Ferrari, D Pannell, M Tildesley, J Seifarth, E Johnson, M Biggerstaff, M Johansson, RB Slayton, J Levander, J Stazer, J Salermo, MC Runge. COVID-19 reopening strategies at the county level in the face of uncertainty: Multiple Models for Outbreak Decision Support. *medRxiv* doi:10.1101/2020.11.03.20225409.
- P2. Zika Modeling and Projections for Vaccination Trials Collaboration (alphabetical): J Asher, C Barker, G Chen, D Cummings, M Chinazzi, S Daniel-Wyman, M Fischer, N Ferguson, D Follman, ME Halloran, M Johansson, K Kugeler, J Kwan, J Lessler, IM Longini, S Merler, A Monaghan, A Pastore y Piontti, TA Perkins, DR Prevots, R Reiner, L Rossi, I Rodriguez-Barrquer, AS Siraj (P), K Sun, A Vespignani, Q Zhang. Preliminary results of models to predict areas in the Americas with increased likelihood of Zika virus transmission in 2017. *bioRxiv* doi:10.1101/187591.
- P1. Soda KJ (P), SM Moore (F), G España (P), J Bloedow, B Raybaud, B Althouse, MA Johansson, E Wenger, P Welkhoff, TA Perkins (co), QA ten Bosch (G) (co). DTK-Dengue: A new agent-based model of dengue virus transmission dynamics. *bioRxiv* doi:10.1101/376533.

Invited Presentations

Invited seminars

Center for Environmental Health in Northern Manhattan. (2022) **Columbia University**.
Department of Entomology. (2022) **Cornell University**.
Center for Statistics and Quantitative Infectious Diseases. (2021) **University of Florida**.
Center for Infectious Disease Dynamics. (2020) **Pennsylvania State University**.
MIDAS Webinar Series. (2020)
COVID-19 Modeling Consortium. (2020) **University of Texas, Austin**.
Population Biology, Ecology, and Evolution Graduate Group. (2019) **Emory University**.
School of Public Health. (2019) **Fudan University**.
Pacific Southwest Center of Excellence in Vector-Borne Diseases. (2018) **University of California, Davis**.
Department of Biological Sciences. (2017) **Virginia Tech**.
Theoretical Biology and Biophysics Group. (2017) **Los Alamos National Laboratory**.
Department of Pathobiology. (2016) **University of Illinois**.
College of Global Public Health. (2016) **New York University**.
Department of Epidemiology. (2016) **Indiana University - Purdue University Indianapolis**.
Department of Biology. (2016) **University of Puerto Rico, Rio Piedras**.
Department of Biological Sciences. (2015) **Florida State University**.
Public Health Dynamics Laboratory. (2014) **University of Pittsburgh**.
Disease Modeling Group. (2014) **Princeton University**.
Department of Biology. (2014) **Georgetown University**.
Department of Biological Sciences. (2014) **University of Notre Dame**.
Department of Ecology and Evolutionary Biology. (2014) **University of Toronto**.
Global Health Group. (2013) **University of California, San Francisco**.

Invited conference presentations

iFAST Theoretical Ecology Symposium to celebrate Simon Levin's 80th birthday. (2021) University of Oklahoma. By teleconference.
"Integrating Parallel Data Streams in Disease Ecology" Symposium. (2020) Ecological Society of America Annual Meeting, Salt Lake City, UT. (withdrawn on account of the COVID-19 pandemic)
"Artificial Intelligence and Tropical Medicine: New Approaches to Understand and Combat Emerging Tropical Diseases" Symposium. (2019) American Society of Tropical Medicine and Hygiene Meeting, Washington, DC.
Annual Meeting of IMPACTS Belize: Improving Laboratory Diagnostics, Clinical Care and Surveillance for Arboviral Diseases in Belize. (2019) Belize City, Belize.
I Congreso de Malaria: Ciencia básica, epidemiología y control. (2019) Universidad de Costa Rica. San Juan, Costa Rica. (declined and sent PhD student in my place)
Partnership for Dengue Control Workshop on "Pre-vaccination screening for the use of dengue vaccines with differential performance dependent on serostatus." (2019) Annecy, France. (declined and sent postdoc in my place)

Mathematics of Planet Earth 2013+ Workshop on Global Change and Vector-Borne Diseases: Mapping Emerging Infectious Diseases. (2018) George Mason University. Fairfax, VA. (declined due to illness)

Workshop on Multiscale Dynamics of Infections. (2018) Mathematical Biosciences Institute. Columbus, OH. (declined and sent Research Assistant Professor in my place)

Workshop on Disease Ecology / Eco-Epidemiology. (2018) Mathematical Biosciences Institute. Columbus, OH.

Symposium on the Population Biology of Vector-Borne Diseases. (2018) University of Georgia. Athens, GA.

Plenary speaker at Computational Biology for Infectious Diseases Summer School. (2017) International Center for Interdisciplinary Science and Education. Quy Nhon, Vietnam.

Workshop on Weather, Climate and Health. (2017) Jointly sponsored by National Center for Atmospheric Research and Centers for Disease Control. Boulder, CO.

Society for Mathematical Biology Annual Meeting. (2017) Salt Lake City, UT. (declined due to conflict with another invited conference presentation)

Institute for Disease Modeling Symposium. (2015, 2016, 2017) Institute for Disease Modeling, Bellevue, WA.

“Repellents” Symposium. (2016) XXV International Congress of Entomology, Orlando, FL.

Ecology and Evolution of Infectious Diseases Conference. (2016) Cornell University, Ithaca, NY.

Zika Modeling Coordination Group. (2016) Presented via phone to HHS BARDA in Washington, DC.

Pan American Health Organization. (2016) Presented via phone to PAHO in Washington, DC.

“Modeling Chikungunya Spread and Control” Symposium. (2015) American Society of Tropical Medicine and Hygiene Meeting, Philadelphia, PA.

“Prospects and Need for Targeted Control of Vector-Borne Diseases” Symposium. (2015) American Society of Tropical Medicine and Hygiene Meeting, Philadelphia, PA.

XVI Colombian Conference in Tropical Medicine and Parasitology. (2015) Santa Marta, Colombia.

“Modeling in Vector Ecology Research” Symposium. (2015) Society of Vector Ecology Meeting, Albuquerque, NM.

Institute for Disease Modeling Symposium. (2015) Institute for Disease Modeling, Bellevue, WA.

Pan-American Dengue Network Meeting. (2014) Belem, Para, Brazil.

RAPIDD Workshop on Vector-Borne Disease Mapping and Mobility. (2014) University of Southampton. Winchester, UK.

Workshop to Develop a Research Agenda for Assessing Vector Control to Prevent Dengue. (2014) Fondation Merieux. Annecy France.

Workshop on Rapid Evolution and Sustainability. (2013) Mathematical Biosciences Institute. Columbus, Ohio.

RAPIDD Workshop on Network and Individual-Based Models in Epidemiology. (2013) Princeton University. Princeton, New Jersey.

RAPIDD Workshop on Combining Modeling and Mapping for Policy. (2013) University of Oxford. Oxford, UK

RAPIDD Workshop on Transmission Dynamics of Japanese Encephalitis Virus. (2012) University of Florida. Gainesville, Florida.

RAPIDD Workshop on Quantification of Fine Scale Human Movement. (2012) Emory University. Atlanta, Georgia.

Foreign Animal Disease Threats Interagency Working Group Meeting. (2012) White House Conference Center. Washington, DC.

"Insights from population biology for the application of genetically modified mosquitoes to disease control" DIMACS/MBI Workshop on Genetics and Disease Control. (2011) Cape Coast, Ghana.

"Effects of evolutionarily labile species interactions on spatial spread dynamics of invasions" Synthesis of the Ecology and Evolution of Invasive Species Special Workshop. (2009) Lake Tahoe, California.

Other invited presentations

"Impacts of K-12 school closure on the COVID-19 pandemic in Indiana" to the **Indiana Pandemic Information Collaborative**. (2020)

"Estimating unobserved SARS-CoV-2 infections in the United States" to the **US Government Pandemic Prediction and Forecasting Science and Technology Working Group**. (2020)

"Cost-effectiveness of Dengvaxia in Puerto Rico" at the **Centers for Disease Control and Prevention**, American Committee on Immunization Practices. (2019)

"Model-based projections of Zika virus infections among childbearing women in the Americas" to the **US Government Pandemic Prediction and Forecasting Science and Technology Working Group**. (2016)

"Recasting the transmission dynamics of mosquito-borne pathogens" at the **Foreign Animal Disease Threats Interagency Working Group**. (2012) White House Conference Center, Washington, DC.

Invited meeting participation

"Modeling for Disease Outbreaks: Practical Approaches to Understanding and Using Models" Pre-Meeting Course offered by the **ASTMH Committee on Global Health**. (2020) Panel Moderator.

ZikaPLAN Mathematical Modeling Working Group Meeting. (2017) London, UK. (declined due to conflict with an invited conference presentation)

"Efficacy trials of ZIKV Vaccines: endpoints, trial design, site selection" Workshop. (2017) **World Health Organization**.

"Comparative modelling of dengue vaccine public health impact" Workshop. (2016) **World Health Organization**.

Other Presentations

- Contributed talk: Epidemics International Conference on Infectious Disease Dynamics. Charleston, SC. 2019.
- Contributed talk: Ecological Society of America Annual Meeting. Louisville, KY. 2019.
- Contributed talk: Genomic Epidemiology of Malaria Conference. Wellcome Genome Campus, United Kingdom. 2018.
- Contributed talk: Epidemics International Conference on Infectious Disease Dynamics. Sitges, Spain. 2017.
- Contributed poster: American Society of Tropical Medicine and Hygiene Annual Meeting. Baltimore, MD. 2017.
- Contributed talk: Ecological Society of America Annual Meeting. Portland, OR. 2017.
- Contributed talk: Midwest Q-Bio Symposium. Notre Dame, IN. 2017.
- Contributed poster: American Society of Tropical Medicine and Hygiene Annual Meeting. Atlanta, GA, 2016.
- Contributed talk: Epidemics International Conference on Infectious Disease Dynamics. Clearwater Beach, FL. 2015.
- Contributed poster: American Society of Tropical Medicine and Hygiene Annual Meeting. New Orleans, LA. 2014.
- Contributed talk: Ecological Society of America Annual Meeting. Baltimore, MD. 2015.
- Contributed poster: Ecology and Evolution of Infectious Diseases Conference. Fort Collins, CO. 2014.
- Contributed poster: 5th Annual Conference on Genomic Epidemiology of Malaria. Sanger Institute, Cambridge, UK. 2014.
- Contributed talk: Epidemics International Conference on Infectious Disease Dynamics. Amsterdam, Netherlands. 2013.
- Contributed talk: American Society of Tropical Medicine and Hygiene Annual Meeting. Washington, DC. 2013.
- Contributed talk: International Conference on Dengue and Dengue Hemorrhagic Fever. Bangkok, Thailand. 2013.
- Contributed talk: Ecological Society of America Annual Meeting. Minneapolis, MN. 2013.
- Contributed poster: American Society of Tropical Medicine and Hygiene Annual Meeting. Atlanta, GA. 2012.
- Contributed talk: Ecological Society of American Annual Meeting. Portland, OR. 2012.
- Contributed talk: Society for Mathematical Biology Annual Meeting. Knoxville, TN. 2012.
- Contributed poster: Ecology and Evolution of Infectious Diseases Conference. Ann Arbor, MI. 2012.
- Contributed talk: Society for the Study of Evolution Annual Meeting. Portland, OR. 2011.
- Contributed poster: Society for the Study of Evolution Annual Meeting. Norman, OK. 2010.
- Contributed talk: Ecological Society of America Annual Meeting. Albuquerque, NM. 2009.
- Contributed talk: Ecological Society of America Annual Meeting. San Jose, CA. 2007.
- Contributed poster: Ecological Society of America Annual Meeting. Memphis, TN. 2006.

Contributed poster: Society for Mathematical Biology Annual Meeting. Ann Arbor, MI. 2004.

Internal Presentations

3-Minute Lightning Talk. Moment to See, Courage to Act. Office of the Provost. 2021.
Seminar. Department of Biological Sciences. 2019.
Summer Scholars Program. Center for Research Computing. 2015, 2016, 2017.
Seminar. Department of Biological Sciences. 2016.
Colloquium. Department of Applied and Computational Mathematics and Statistics. 2014.
Presentation to Indiana Clinical Translational Sciences Institute Videoconference. 2014.

Grants and Sponsored Programs

In total, I and members of my lab have been awarded \$8,547,016 in direct and indirect funds from external sources in the 7+ years since I became an independent investigator. Of that, \$4,849,954 was awarded to me as Principal Investigator, \$2,887,080 was awarded to me as Co-Principal Investigator or Co-Investigator, and \$809,982 was awarded to members of my lab. These funds derive from 23 awards from 18 different funders spanning federal agencies, non-governmental organizations, industry, and foundations. Awards to me are listed below, categorized by pending, current, and completed, by my status on the award, and sorted by end date within each of those categories. Dollar amounts listed denote total costs in support of activities under my direction.

Current external on which I am Principal Investigator

NIH NIGMS MIRA R35 (\$1,956,250) 2021 - 2026

Model-based inference and forecasting of co-circulating pathogen dynamics

Role: Principal Investigator

Emergent Biosolutions (\$235,636) 2021 - 2023

Analytical and simulation tools to inform CHIKV VLP efficacy trial design and execution

Role: Principal Investigator

Department of Defense (\$512,186) 2020 - 2022

COVID-19 Modeling Support

Role: Principal Investigator

NSF RAPID Award (\$199,883) 2020 - 2022

Real-time updating of an agent-based model to inform COVID-19 mitigation strategies

Role: Principal Investigator

Vaccine Impact Modeling Consortium Contract (\$537,500) 2018 - 2022

Yellow Fever and Japanese Encephalitis Vaccine Impact Modeling

Role: Principal Investigator (Co-PI: Sean Moore, Notre Dame)

Current external on which I am Co-Principal Investigator or Co-Investigator

NSF EEID (\$213,610 to Perkins) 2021 - 2025

Identifying local-to-global "win-win" solutions for human health and sustainability through infectious disease control

Role: Co-Investigator (PI: Jason Rohr, Notre Dame)

NIH NIAID R21 (\$25,337 to Perkins) 2021 - 2023

Assessing the impact of COVID-19 interventions on human mobility and SARS-CoV-2 transmission dynamics in the United States

Role: Co-Investigator (PI: Sean Moore, Notre Dame)

Department of Defense (\$66,668 to Perkins) 2020 - 2022

Remote Emerging Disease Intelligence Network (REDI-NET)

Role: Co-I (PI: Nicole Achee, Notre Dame)

NSF RAPID Award (\$63,337 to Perkins) 2020 - 2022

Wastewater Informed Epidemiological Monitoring of SARS-CoV-2

Role: Co-PI (PI: Kyle Bibby, Notre Dame)

UNITAID Award (\$1,166,096 to Perkins) 2019 - 2024

Advancing Spatial Repellents for Vector-Borne Disease Control

Role: Co-PI (PI: John Grieco, Notre Dame)

Subcontract from Colorado State University (\$640,000 to Perkins) 2018 - 2023

USDA-NIFA through NSF Ecology and Evolution of Infectious Diseases Program

Cross-scale dynamics of multi-host vector-borne pathogens at the wildlife-domestic animal interface in ruminant communities

Role: Co-PI (PI: Christie Mayo, Colorado State)

Completed external on which I was Principal Investigator

Coalition for Epidemic Preparedness Innovations Contract (\$201,390) 2019 - 2020

Epidemiology and Vaccine Demand Curve Modelling

Role: Principal Investigator

UNICEF Brazil Award (\$32,735) 2019 - 2020

Institutional Contract to Develop a Simulation Model of Dengue, Chikungunya, and Zika Incorporating Spatial Mobility Data in Brazil

Role: Principal Investigator

DARPA Young Faculty Award and Director's Fellowship (\$754,147) 2016 - 2020

Bridging Gaps Across Multiple Spatial Scales for Models of Mosquito-Borne Viral Disease Dynamics

Role: Principal Investigator

NSF RAPID Award (\$200,000) 2016 - 2018

Overcoming uncertainty to enable estimation and forecasting of Zika virus transmission

Role: Principal Investigator (Co-PI: Robert Reiner, University of Washington)

GlaxoSmithKline Contract (\$200,000) 2015 - 2017

Simulating Virtual Vaccine Efficacy Trials via Modeling: Application to Dengue

Role: Principal Investigator

Ralph E. Powe Junior Faculty Enhancement Award (\$10,000) 2015 - 2016
Oak Ridge Associated Universities
Inferring Spatiotemporal Drivers of Vector-Borne Disease Incidence in the United States

Role: Principal Investigator
Intellectual Ventures Contract (\$11,227) 2015
Institute for Disease Modeling Contract: Dengue Modeling
Role: Principal Investigator

Completed external on which I was Co-Principal Investigator or Co-Investigator

120Water Award (\$10,000 to Perkins) 2020
SARS-CoV-2 Wastewater Surveillance Program

Role: Co-PI (PI: Kyle Bibby, Notre Dame)
Subcontract from UC Davis (\$332,887 to Perkins) 2015 - 2020
National Institutes of Health, National Institute of Allergy and Infectious Disease
Quantifying Heterogeneities in Dengue Virus Transmission

Role: Co-Investigator (PI: Thomas Scott, University of California, Davis)
Subcontract from Johns Hopkins University (\$260,027 to Perkins) 2017 - 2019
National Institutes of Health, National Institute of Allergy and Infectious Disease
Methods for Reducing Spatial Uncertainty and Bias in Disease Surveillance
Role: Leader of one of three independent modeling teams funded to provide model-based guidance on Zika virus vaccine trial site selection to the NIH VRC.

Subcontract from University of California, San Francisco (\$96,106 to Perkins) 2015 - 18
Bill and Melinda Gates Foundation

Applying Molecular Epidemiology to Accelerate to Zero
Role: Co-Investigator (PI: Bryan Greenhouse, UC San Francisco)

Subcontract from University of Oxford (\$13,012 to Perkins) 2014 - 2015
Bill and Melinda Gates Foundation

Strategic Planning Tools for Staging Malaria Elimination
Role: Co-Investigator (PI: David Smith, University of Oxford)

Teaching

Instructor (Undergraduate)

How Will Majoring in Biological Sciences Equip You to Fight the Next Pandemic?
University of Notre Dame, Fall 2021

Evolution and Medicine
University of Notre Dame, Spring 2015 - 2018, Fall 2018

Instructor (Graduate)

Infectious Disease Epidemiology and Ecology
University of Notre Dame, Spring 2021 - 2022

Topics in Biocomputing: Statistics for Biology Grad Students
University of Notre Dame, Fall 2018 (Co-Instructor: Jason McLachlan)

Topics in Ecology: Infectious Disease Forecasting
University of Notre Dame, Fall 2017

Topics in Ecology: Bayesian Statistics for Ecologists and Epidemiologists
University of Notre Dame, Fall 2016 (Co-Instructor: Jason McLachlan)

Topics in Infectious Disease: Population Biology of Infectious Disease
University of Notre Dame, Fall 2015 (Co-Instructor: Elizabeth Archie)

Instructor (Workshop)

Quant Camp, for incoming Biological Sciences PhD students

University of Notre Dame Environmental Research Center, Summer 2017 - 2019

Computational Biology for Infectious Diseases Summer School (Epidemic Forecasting)

International Center for Interdisciplinary Science and Education, Quy Nhon,
Vietnam, Fall 2017

Teaching Assistant

An Introduction to Evolution and Animal Diversity
University of California, Davis, Winter 2007

Humankind in the Biotic World

University of Tennessee, Knoxville, Spring 2005

Biodiversity

University of Tennessee, Knoxville, Fall 2004

Guest Lecturer

Vaccine evaluation and mathematical modeling: dengue as a case study
Global Health Challenges

University of Notre Dame, Fall 2016

Week-long series of lectures on model-guided fieldwork

Topics in Biology: Quantitative Thinking in Ecology

University of Puerto Rico, Rio Piedras, Spring 2016

Lecture on HIV epidemiology for a design class working on an HIV awareness project
Design for Social Good

University of Notre Dame, Fall 2014

Lectures on stability analysis of dynamical systems models in ecology

Mathematical Methods in Population Biology

University of California, Davis, Fall 2012

Lectures on stability analysis of dynamical systems models in ecology

Mathematical Methods in Population Biology

University of California, Davis, Fall 2011

Lecture on modeling the spatial spread of invasive species

Conservation Biology Research Seminar

University of California, Davis, Winter 2010

Mentorship

Research Assistant Professors

Sean Moore, PhD in Zoology, Oregon State University. March 2017 – present

Guido España, PhD in Electrical Engineering, Universidad Nacional de Colombia.
December 2020 – present

Postdoctoral Researchers

Morgan Smith, June 2020 – August 2020

PhD in Biological Sciences, University of Notre Dame

Current status: Epidemiological Data Analyst, CDC Foundation and State of Pennsylvania

Amir Siraj, August 2015 – February 2020

PhD in Geography, University of Denver

Current status: Research and Data Analyst, Malaria and Neglected Tropical Diseases Department, PATH

Guido España, January 2016 – November 2020

PhD in Electrical Engineering, Universidad Nacional de Colombia

Current status: Research Assistant Professor, University of Notre Dame

James Soda, June 2017 – July 2019

PhD in Computational Sciences, Florida State

Current status: Assistant Professor (tenure-track), Mathematics, Quinnipiac University

Anita Lerch, August 2018 – present

PhD, Swiss Tropical and Public Health Institute

Sean Cavany, June 2018 – present

PhD in Epidemiology, London School of Hygiene and Tropical Medicine

Alex Meyer, June 2021 – present

PhD in Applied Mathematics, University of California, Davis

Doctoral Students

John Huber, PhD in Biological Sciences, defended 2021

Thesis: "Jointly leveraging mathematical models and data to understand malaria transmission and control"

Status after graduation: MD student at Washington University in St. Louis

Rachel Oidtman, PhD in Biological Sciences, defended 2020

Thesis: "Understanding and forecasting spatiotemporal variation in emerging arboviruses"

Status after graduation: Postdoc at University of Chicago with Sarah Cobey

Quirine ten Bosch, PhD in Biological Sciences, defended 2017

Thesis: "Insights from mathematical modeling into the natural history, dynamics, and control of dengue"

Status after graduation: Postdoc at Institut Pasteur in Paris, France with Simon Cauchemez and Henrik Salje

Current status: Assistant Professor (tenure-track), Quantitative Veterinary Epidemiology, Wageningen University, The Netherlands

Annaliese Wieler, PhD in Biological Sciences, Aug 2018 – present

Quan Tran, PhD in Biological Sciences, Jan 2019 – present

Marya Poterek, PhD in Biological Sciences, Fall 2019 – present

Carly Barbera, PhD in Biological Sciences, Fall 2019 – present (co-advised with Rohr)

Stacy Mowry, PhD in Biological Sciences, Fall 2021 – present
Manar Alkuzweny, PhD in Biological Sciences, Fall 2021 – present

Master's Students

Michael Prough, MS in Global Health, 2016
Thesis: "Analysis of *Aedes aegypti* Hotspots and Hot Zones in Two Neighborhoods of Santo Domingo, Ecuador"
Status after graduation: clinical research coordinator at University of Miami

Jonah Barreto, MS in Global Health, 2017
Thesis: "Evaluating Effects of Spatial Repellents on *Aedes aegypti* Behavior and Bionomics in Rural Thailand"
Status after graduation: employed at Epic Systems Corporation in Madison, WI

Undergraduate Researchers

Ethan Holland, Biological Sciences major, Fall 2014 – Spring 2015
Status after graduation: MD student at University of Florida

John Huber, ACMS major, Fall 2014 – Summer 2017
Status after graduation: MPhil in Veterinary Sciences with Olivier Restif at University of Cambridge

Adam Haydel, Science-Business major, Spring 2015 – Spring 2016
Status after graduation: MD student at Louisiana State University

Caleb Johnson, ACMS major, Spring 2015 – Spring 2016
Status after graduation: Data Scientist at Booz Allen Hamilton

Yaohan Ding, International Summer Undergraduate Research Experience (iSURE), Notre Dame International, Summer 2017

Yutong Yao, Pre-professional and Economics major, Fall 2016 – Fall 2019
Status after graduation: MPH Student at Emory University

Marya Poterek, Science-Computing major, Fall 2016 – Spring 2019
Status after graduation: PhD student in Biological Sciences at Notre Dame

Katherine Koh, ACMS major, Fall 2016 – Summer 2019

Maggie Walters, Biological Sciences major, Fall 2016 – Summer 2019
Status after graduation: Post-Bachelor Fellowship at the Institute for Health Metrics and Evaluation at the University of Washington, Seattle

Henri Chung, Biological Sciences major, Fall 2017 – Fall 2019
Status after graduation: PhD student in Bioinformatics and Computational Biology at Iowa State University

Cassandra Miller, ACMS major, Spring 2019 – Spring 2020
Status after graduation: MS student in ACMS at Notre Dame

Carson Hartlage, Biological Sciences major, Summer 2019 – Summer 2020
Status after graduation: lab technician at the University of Michigan

Georgia Mudd, ACMS major, Spring 2019 – present

Kathryn Strimbu, Biological Sciences major, Summer 2019 – Fall 2020

Maggie O'Connor, Biological Sciences major, Fall 2019 – present

Maggie Elliott, Biological Sciences major, Fall 2019 – present

Brooke Rodriguez, Mathematics major, Fall 2021 – present

Amir Khouzam, Neuroscience and Behavior major, Fall 2021 – present

Nadim Khouzam, Neuroscience and Behavior major, Fall 2021 – present

Other Student Supervision

Kaitlynn Meis, Integrated Biomedical Sciences, rotated for six weeks in Spring 2017
Karlynn Harrod, MS in ACMS, 2016

Graduate Student Committees

Sal Curasi, PhD in Biological Sciences, Rocha advisee, 2021
Jenna Davis, PhD in Biological Sciences, Lobo advisee, 2019
Elizabeth Miller, PhD in Biological Sciences, Archie advisee, 2016
Morgan Smith, PhD in Biological Sciences, Michael advisee, 2019
Casey Ferris, MS in Computer Science & Engineering, Madey advisee, 2017
Morgan Smith, MS in Global Health, Michael advisee, 2015
Sara Benevente, MS in Biological Sciences, Belovsky advisee, 2018
Ian Klupar, MS in Biological Sciences, Rocha advisee, 2020
Brittini Bertolet, PhD in Biological Sciences, Jones advisee, 2021
Mauna Dasari, PhD in Biological Sciences, Archie advisee, 2021
Megan Vahsen, PhD candidate in Biological Sciences, McLachlan advisee
Kate Vendrely, PhD candidate in Biological Sciences, Ferdig advisee
Timothy Burton, PhD candidate in Biological Sciences, Lobo advisee
Chelsea Weibel, PhD candidate in Biological Sciences, Archie advisee
Tiffany Huwe, PhD student in Biological Sciences, Koepfli advisee
Aurel Holzschuh, PhD student in Biological Sciences, Koepfli advisee
Alexis Korotasz, PhD student in Biological Sciences, Rohr advisee
Alan Costello, PhD student in Biological Sciences, Moore advisee
Camille Mosley, PhD student in Biological Sciences, Jones advisee

Service

Internal Service

University Committees

College of Science Dean Search (2020 – 2021)
COVID-19 Reopening, Epidemiology Working Group (2020)
Task Force on Grand Challenges, Scientific Wellness Initiative (2018)

Departmental Committees

Vector Biology Faculty Search (Chair 2021 – 2022)
Inclusive Excellence (2021 – 2022)
Reappointment Committee (2021 – 2022)
Disease Biology Faculty Search (2020 – 2021)
Visibility (2020 – 2021)
Vector Biology Faculty Search (2019 – 2020)
Graduate Recruitment (2014 – 2018, Chair or Co-Chair 2018 – 2022)
Graduate Curriculum (2015 – 2020)
Global Health Faculty Search (2017 – 2018)
Biocomputing (2015 – 2017)

Ecology, Evolution, and Environmental Change Faculty Search (2015 – 2016)
Co-Organizer and Co-Instructor (2017 – 2019)
Quant Camp at UNDERC for incoming Biological Sciences PhD students
Symposium Co-Organizer (2017)
5th Midwest Q-Bio Symposium held at Notre Dame
Represented Eck Institute for Global Health during Notre Dame Day (2016)

External Service

Service to Scientific Organizations

Steering Committee (2021 – present)

Models of Infectious Disease Agents Study (**MIDAS**) Coordination Center

Editorial Activity

Associate Editor (2020 – present)

PLOS Computational Biology

Associate Editor (2017 – 2021)

Frontiers in Ecology and Evolution, Population and Evolutionary Dynamics

Guest Editor (2018)

PLOS Computational Biology

Expert Consultation

Consultant (2021 – present)

"Cost-effectiveness of TAK-003 in Puerto Rico" for the **Centers for Disease Control and Prevention's** American Committee on Immunization Practices

Consultant (2020 – present)

Emergent Biosolutions

I was recruited to advise on chikungunya vaccine efficacy trial planning.

Consultant (2019)

"Cost-effectiveness of Dengvaxia in Puerto Rico" for the **Centers for Disease Control and Prevention's** American Committee on Immunization Practices

Meeting Participant (2017)

"Efficacy trials of ZIKV Vaccines: endpoints, trial design, site selection" Workshop.
World Health Organization. Geneva, Switzerland.

Consultant (2016 – 2017)

College of Global Public Health, **New York University**

I was recruited to contribute to the development of an agent-based model of Zika virus transmission for an internally funded project at NYU.

Working Group Member (2016)

Zika Modeling Coordination Group convened by **HHS BARDA**

Working Group Member (2015 – 2016)

Comparative Modelling of Dengue Vaccine Public Health Impact Working Group convened and supported by the **World Health Organization**

Grant Reviewer

Study Section Panelist (2018, 2020, 2021)

NIH Infectious, Reproductive, Asthma and Pulmonary Conditions Study Section
Reviewer (2021)

New Frontiers in Research Fund, **Social Sciences and Humanities Research
Council of Canada**

Reviewer (2021)

L'Agence Nationale de la Recherche, France

Reviewer (2021)

Ralph E. Powe Junior Faculty Enhancement Awards, **Oak Ridge Associated
Universities**

Reviewer (2020)

MIDAS COVID-19 Modeling Urgent Grant Program

Study Section Panelist (2020)

NIH Emergency Awards: Rapid Investigation of Severe Acute Respiratory
Syndrome Coronavirus 2 and Coronavirus Disease 2019

Reviewer (2020)

Indiana CTSI Translational Sciences Postdoctoral Fellowship

Study Section Panelist (2019)

NIH US-Brazil Collaborative Biomedical Research Program

Study Section Panelist (2019)

Wellcome Trust Climate Change and Health Panel (declined due to conflict)

Study Section Panelist (2015, 2017, 2018, 2019, 2022)

NSF Program

Grant Proposal Reviewer (2015, 2015, 2018)

Ad hoc proposal review for **Medical Research Council UK**

Grant Proposal Reviewer (2017)

Ad hoc proposal review for **Kansas City Life Sciences Institute**

Study Section Panelist (2016, 2017)

NIH Special Emphasis Panel on "Rapid Assessment of Zika Virus (ZIKV)
Complications (R21)"

Grant Proposal Reviewer (2016)

Ad hoc proposal review for Zika Research Grant Initiative by the **Florida
Department of Health's** Biomedical Research Programs

Grant Proposal Reviewer (2016)

Ad hoc proposal reviewer for **UK Royal Society** University Research Fellowship
Program

Conference Organizing

Scientific Committee (2019)

Epidemics International Conference on Infectious Disease Dynamics
Charleston, SC

Symposium Organizer (2015)

"Prospects and Need for Targeted Control of Vector-Borne Diseases"

American Society of Tropical Medicine and Hygiene Meeting, Philadelphia, PA

Workshop Organizer (2015)

RAPIDD Workshop on Model-Guided Clinical Trial Design

Symposium Organizer (2015)

Symposium titled “Dengue Research Exemplifies the Interface of Basic and Applied Population Biology” sponsored by the **American Society of Naturalists**

Society for the Study of Evolution Meeting, Guarujá, Brazil

Workshop Organizer (2015)

RAPIDD Workshop on Targeted Control of Vector-Borne Pathogens

Mentorship

Invited Panelist (2020)

Water Cooler Chat: Modeling the SARS-CoV-2 Outbreak: Challenges and Opportunities, **Ecological Society of America**, Disease Ecology Section

Panelist for Global Health Peer-to-Peer Networking Event (2016)

American Society of Tropical Medicine and Hygiene Meeting, Atlanta, GA

Mentored an undergraduate from the SEEDS Program (2007)

Ecological Society of America Annual Meeting

Other Reviewing

Statistical Reviewer (2019 – present)

Lancet Infectious Diseases, Lancet Microbe

Invited to serve in this capacity on an ongoing basis with honorarium

Reviewer (2020)

Davidson Fellows Scholarship, **Davidson Institute for Talent Development**

Book Proposal Reviewer (2019)

CRC Press

Book Chapter Reviewer (2019)

Oxford University Press

Book Proposal Reviewer (2018, 2019)

Cambridge University Press

Judge for Volterra Award (2013)

Theoretical Ecology Section, **Ecological Society of America**

Manuscript Reviewer

Acta Oecologia (1), *Acta Tropica* (1), *American Journal of Epidemiology* (1), *American Journal of Tropical Medicine and Hygiene* (6), *American Naturalist* (1), *BioSystems* (1), *BMC Medicine* (1), *Bulletin of Mathematical Biology* (3), *EcoHealth* (1), *Ecology* (3), *Ecological Complexity* (1), *Ecology Letters* (4), *Ecological Modelling* (1), *eLife* (5), *Emerging Infectious Diseases* (3), *Epidemics* (2), *Evolution* (1), *Evolution, Medicine, and Public Health* (1), *Frontiers in Zoology* (1), *Genetics* (1), *Journal of Mathematical Biology* (1), *Journal of Theoretical Biology* (2), *Journal of the Royal Society Interface* (1), *Journal of Vegetation Science* (1), *Lancet Infectious Diseases* (8), *Lancet Microbe* (2), *Malaria Journal* (2), *Mathematical Modeling of Natural Phenomena* (1), *Nature* (1), *Nature Communications* (4), *Nature Microbiology* (3), *Oikos* (1), *Parasites and Vectors* (2), *PLOS Biology* (2), *PLOS Computational Biology* (6), *PLOS Medicine* (3), *PLOS ONE* (3), *PLOS Neglected Tropical Diseases* (10), *Proceedings of the National*

Academy of Sciences (8), Proceedings of the Royal Society B (4), Science (4), Science Translational Medicine (1), Scientific Reports (3), Theoretical Ecology (4)